

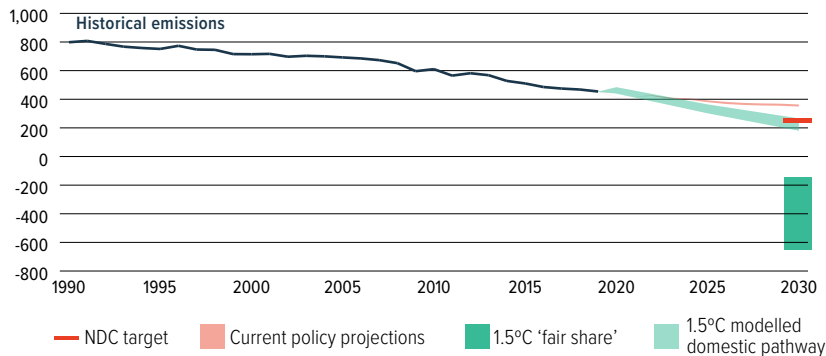
UNITED KINGDOM

CLIMATE TRANSPARENCY REPORT: COMPARING G20 CLIMATE ACTION

2022



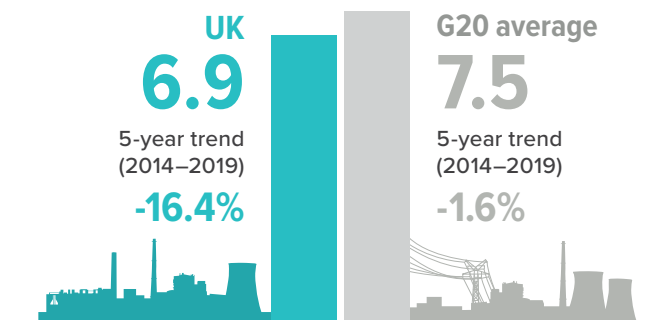
NOT ON TRACK FOR A 1.5°C WORLD

1.5°C compatible emissions pathway (MtCO₂e/year)¹


The UK's updated NDC target would decrease emissions 68% below 1990 levels, or to approximately 254 MtCO₂e (excl. LULUCF). To keep below the 1.5°C temperature limit, analysis by the 1.5°C Pathways Explorer shows that the UK's emissions would need to be around 194 MtCO₂e by 2030, leaving an ambition gap of about 60 MtCO₂e. When compared with its 1.5°C 'fair share' contribution, the UK needs to substantially improve its commitments to be consistent with the Paris Agreement's 1.5°C temperature limit.

Climate Action Tracker, 2022a, 2022b; Climate Analytics, 2022; Gütschow et al., 2021

PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS BELOW G20 AVERAGE

tCO₂e/capita² in 2019


The UK's per capita emissions are 0.92 times the G20 average. Total per capita emissions have decreased by 16% from 2014–2019.

Gütschow et al., 2021; World Bank, 2022

RECENT DEVELOPMENTS



The UK's **Net Zero Strategy** sets a target of **100% clean electricity generation by 2035**, supported by ambitious targets for offshore wind and renewed support for onshore wind and solar.



The Net Zero Strategy also provides **business models to drive uptake of hydrogen and carbon capture storage (CCS)** in the industrial sector.



The strategy **lacks ambition on the potential for behavioural change and demand reduction**. It relies heavily on technological innovation and CO₂ removal, which represents a major risk to successful delivery.

KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION



After the cancellation of the Green Homes Grant, **new policies to drive energy efficiency improvements in homes are essential**. They are also the fastest way to address high energy bills.



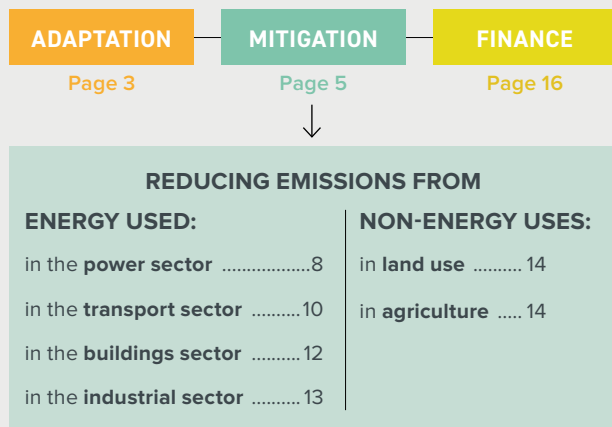
The low cost of renewables does not directly benefit electricity users. The UK government should **reform the electricity market to pass savings on** to the customer, which in turn would drive demand for more renewables.



Setting out a net zero delivery strategy for agriculture and land use, highlighting how the UK will reduce emissions, enhance sinks, adapt to climate change, and meet other environmental goals.

Contents

We unpack the UK's progress and highlight key opportunities to enhance climate action across:



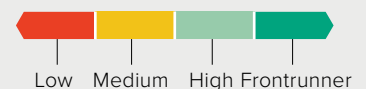
Legend

Trends show developments over the past five years for which data are available. A red exclamation mark indicates negative trends from a climate protection perspective. !

Decarbonisation Ratings³ assess a country's performance compared to other G20 Members. A high score reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.

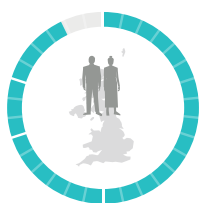


Policy Ratings⁴ evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.



SOCIO-ECONOMIC CONTEXT

Human Development Index



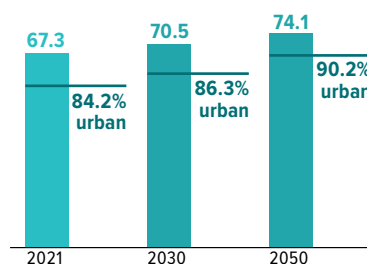
0.93 very high

The Human Development Index (HDI) reflects life expectancy, level of education, and per capita income. The UK ranks very high.

Data for 2019.
UNDP, 2020

Population and urbanisation projections

(in millions)

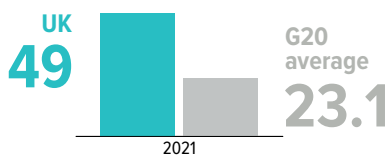


The UK's population is projected to increase by 10% by 2050 and become more urbanised. Policies to drive mitigation and adaptation in cities, such as improved public and active transport, and measures to address urban heat stress, will therefore be important.

United Nations, 2018; World Bank, 2022

Gross Domestic Product (GDP) per capita

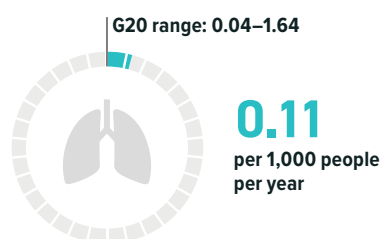
(thousand PPP constant 2015 international \$ per person) in 2021



World Bank, 2021

Death rate attributable to ambient air pollution

(death rate per 1,000 population per year, age standardised) in 2019



Over 15,000 people die in the UK every year due to stroke, heart disease, lung cancer and chronic respiratory diseases as a result of outdoor air pollution. This is one of the lower levels in the G20.

Institute for Health Metrics and Evaluation, 2020

A JUST TRANSITION

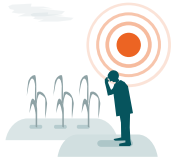
In the UK, 20% of all jobs are likely to be affected in some way by the transition to net zero. Around 3 million workers will be in need of reskilling, particularly in manufacturing and extractive industries. Scotland has established a Just Transition Commission which can help engage the most affected communities. However, no equivalent commission exists for the rest of the UK.

Current evidence on the skills requirements in key growth sectors, such as home retrofitting, is still lacking. The government should deliver on its commitment to provide a net zero skills action plan. Possible actions could include targeted funding to support retraining of North Sea oil and gas workers, a skills passport to enable workers to easily transfer into the renewables industry, and other policies to enable upskilling in future growth sectors.

CCC, 2022; Jeliazkov et al., 2021; PCAN, 2021

ADAPTATION

Paris Agreement: Increase the ability to adapt to the adverse effects of climate change and foster climate resilience and low-GHG development.



The UK's most recent Climate Change Risk Assessment (2021) identified **eight areas that require urgent attention** in the coming years, including **risks to food supply chains and extreme heat**.



Climate change could reduce the capacity of nature to sequester and store carbon, making it more difficult to reach net zero.



Adaptation policy is lagging mitigation policy. Of 34 priority areas, only 7 have good policies in place to address potential impacts of climate change, and only 5 have made notable progress since 2019.

ADAPTATION NEEDS

Impacts of a changing climate

Exposure to warming



0.8°C
Higher

Between 2017 to 2021, the average summer temperatures experienced by people in the UK were 0.8°C higher than the 1986–2005 average global mean temperature increase of 0.3°C.

Changes in the ability to work due to exposure to excessive heat



6m Labour hours lost
77% increase

In 2021, heat exposure in the UK led to the loss of 6 million potential labour hours, a 77% increase from 1990–1999.

Loss of earnings from heat-related labour capacity reduction



108m Loss in labour capacity (USD)

Extreme heat can make it unbearable or even dangerous to work in a range of economically important sectors. The potential income loss in 2021 – in the service industry, manufacturing, agriculture, and construction sectors – from labour capacity reduction due to extreme heat was USD 108m, or 0.0035% of GDP.

Romanello et al., 2022; World Meteorological Organization, 2022

Exposure to future impacts at 1.5°C warming and higher

Different levels of global warming are projected to have a wide range of impacts of varying severity across the world. The percentages at 1.5°C are calculated as an increase/decrease from the reference period of 1986–2006. Using the projected impacts at 1.5°C of warming as a reference, we compare impacts that may occur at higher levels of warming.

Climatic

	At 2°C	At 2.5°C	At 3°C
Local precipitation : +0.8% at 1.5°C warming	4.7 times	3.6 times	4.5 times
Local snowfall : -37.4% at 1.5°C warming	1.4 times	1.8 times	2 times

In the UK, local precipitation is projected to increase by 0.8% if global temperature rises by up to 1.5°C. Further warming would lead to a wetter climate, with impacts growing 4–5 times with warming of 2°C and beyond. Warming of 1.5°C leads to a strong reduction in local snowfall, of 37.4% relative to the reference period of 1986–2006. At 3°C of warming, the reduction in snowfall would be twice that experienced at 1.5°C.

Fresh water

	At 2°C	At 2.5°C	At 3°C
Surface run-off : +0.7% at 1.5°C warming	8.1 times	7.6 times	9.2 times
River discharge : -0.7% at 1.5°C warming	-4.0 times	-3.8 times	-2.6 times
Total soil moisture content : -1% at 1.5°C warming	1 times	1.1 times	1.6 times

At 1.5°C of warming, surface run-off is projected to increase by 0.7%, due to wetter winters and more extreme weather. The overall soil moisture content will fall 1% at 1.5°C of warming, due in part to more arid summers. These trends are expected to intensify as warming progresses. River discharge is projected to fall by 0.7%, relative to the 1986–2006 baseline, as warming approaches 1.5°C. The negative sign (at 2°C, 2.5°C and 3°C warming) indicates that the impact experienced is opposite to the impact at 1.5°C warming. In other words, further warming is projected to lead to an increase in river discharge relative to the impact at 1.5°C of warming, rather than a decrease.

Hazards	At 2°C	At 2.5°C	At 3°C
Number of people annually exposed to wildfires : 14,099 at 1.5°C warming	2.6 times	1.7 times	2.1 times

At 1.5°C of warming, around 15,000 people would be expected to be exposed to wildfires on an annual basis in the UK. Warming of above 1.5°C would increase the extent of wildfires, although, for the UK, there is not a clear relationship between the level of warming and the extent of wildfires.

Economic	At 2°C	At 2.5°C	At 3°C
Annual expected damage from river flood : +121.1% at 1.5°C warming	1.3 times	1.1 times	1.1 times
Labour productivity due to heat stress: -0.1% at 1.5°C warming	2.1 times	2.7 times	4.3 times

The UK will suffer from increased flooding in a warmer, wetter climate. At 1.5°C of warming, damages from flooding are more than 120% greater than the baseline of 1986–2006. Further warming would increase flood damages further.

Labour productivity will fall by 0.1% relative to the 1986–2006 baseline at 1.5°C of warming. Further warming leads to strong increases in productivity loss, and at 3°C of warming, productivity losses would be four times that experienced at 1.5°C of warming.

For further assessments of impacts under different warming scenarios, and a detailed explanation of the methodology, go to <https://climate-impact-explorer.climateanalytics.org>

Climate Analytics, 2021

ADAPTATION POLICIES

National Adaptation Strategies

Document name	Publication year	Fields of action (sectors)												Monitoring & evaluation process	
		Agriculture	Biodiversity	Coastal areas and fishing	Education and research	Energy and industry	Finance and insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism		Water
Second National Adaptation Programme (NAP)	2018, covering the 2018–2023 period	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓

The Adaptation Reporting Power (ARP) was introduced under the Climate Change Act of 2008 and provides an institutional framework to ensure that organisations of a public nature with climate-sensitive responsibilities report on how they are addressing current and future climate impacts.

In addition, the Climate Change Committee (CCC) provides a biennial progress report on the Government’s progress on adaptation measures, particularly via the NAP.

Nationally Determined Contribution (NDC): Adaptation

TARGETS

Adaptation measures are determined nationally by the constituent countries of the UK.

ACTIONS

The UK’s actions on adaptation are communicated in 5-year NAPs. The next NAP is due in 2023, covering the 2023–2028 period.

MITIGATION

Paris Agreement: Hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.

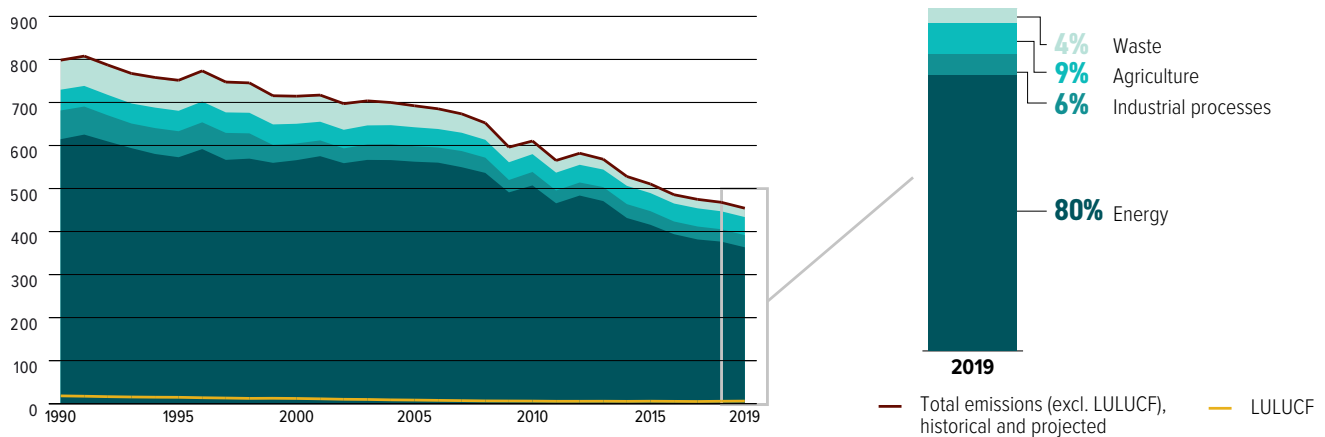
EMISSIONS OVERVIEW



The UK's **total greenhouse gas emissions (excl. LULUCF)** have decreased by **43.1%** between 1990 and 2019. In the same period, its total methane emissions (excl. LULUCF) have decreased by 61.8%.

GHG emissions across sectors⁵

Total sectoral GHG emissions (MtCO₂e/year)

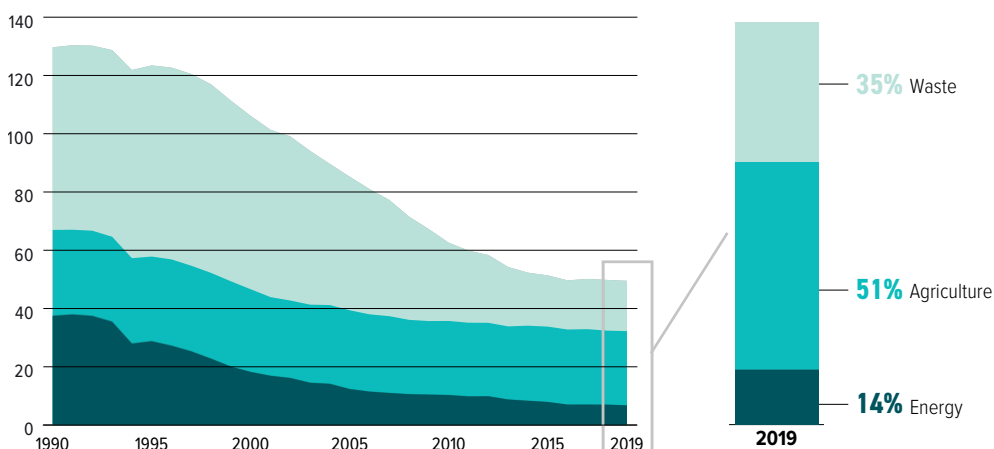


The UK's emissions (excl. LULUCF) decreased by 43% to 454 MtCO₂e/yr. When considered by category, decreases were largely due to a decrease of 41% in energy-related emissions, but decreases were also observed in all other sectors over the same timeframe.

Gütschow et al., 2021

Methane emissions by sector

Total CH₄ emissions (MtCO₂e/year)



The United Kingdom signed the Global Methane Pledge at COP26 in November 2021.

Participating countries pledged to undertake voluntary actions to contribute to a collective reduction of global methane emissions by at least 30% from 2020 levels by 2030. Further scrutiny of plans and implementation will be required.

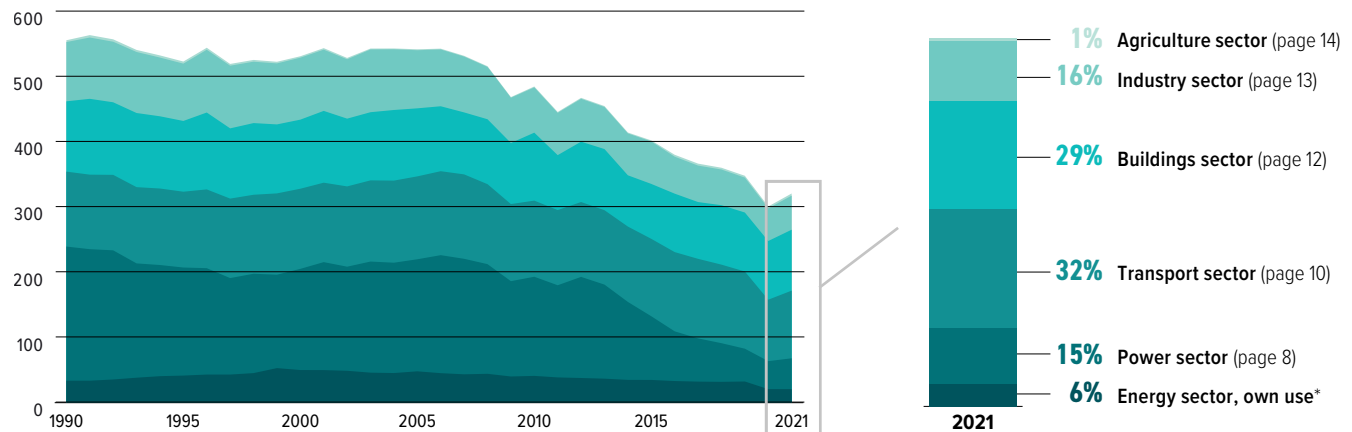
Methane is a potent, though short-lived, greenhouse gas, accounting for an estimated third of global warming. The UK's methane emissions (excl. LULUCF) decreased by 61.8% between 1990–2019 to 49 MtCO₂e/yr.

Most of the UK's methane emissions resulted from agriculture in 2019. Emissions from waste and energy have fallen sharply. The 1996 landfill tax reduced the level of biodegradable waste going to landfill, leading to rapid emissions reductions. Falling emissions in the energy sector are due to reduced production of fossil fuels, and cuts to fugitive emissions.

Climate and Clean Air Coalition, 2021; Gütschow et al., 2021

Energy-related CO₂ emissions by sector

Annual CO₂ emissions (MtCO₂/year)



The largest driver of overall greenhouse gas emissions are CO₂ emissions from fuel combustion. In the UK, emissions have been decreasing since 2005. The transport sector is the largest contributor to emissions with a 32% share, followed by buildings and industry with 29% and 16%, respectively. A decade ago, the power sector was the largest source of CO₂ emissions in the UK. It is now the fourth largest, due to strong reductions in coal-fired electricity generation.

Enerdata, 2022

*Includes energy-related CO₂ emissions from extracting and processing fossil fuels.

ENERGY OVERVIEW



Rapid deployment of renewables in the power sector means that, in 2021, **22% of primary energy consumption was zero carbon**. However, 76% of energy consumption remains fossil-fuel-based, with oil consumption in transport and gas consumption in the buildings and industry sectors requiring urgent action.

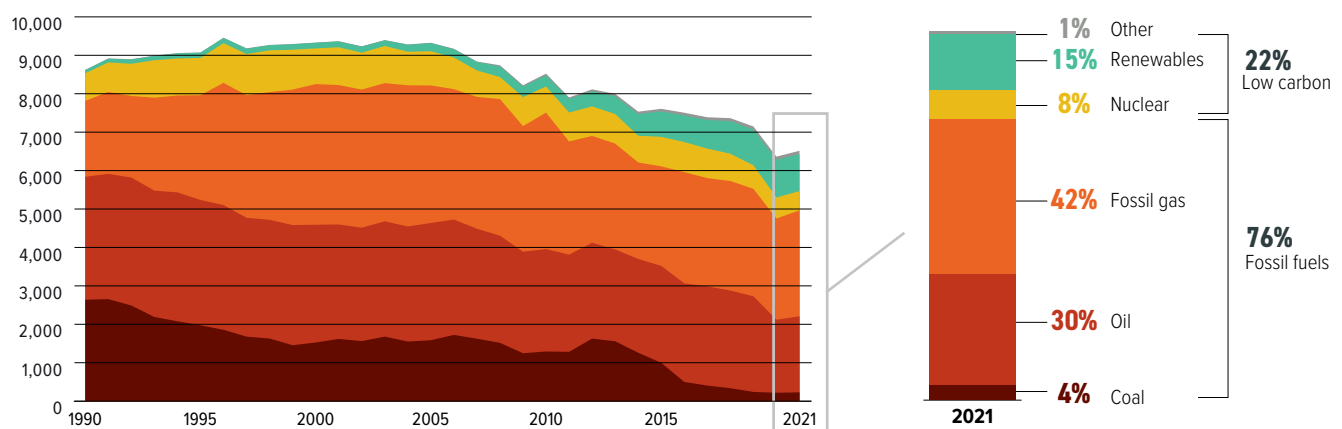


The share of fossil fuels globally needs to fall to **67% of global total primary energy by 2030** and to 33% by 2050, and to substantially lower levels without carbon capture and storage.

Rogelj et al., 2018

Energy mix

Total primary energy supply (PJ)

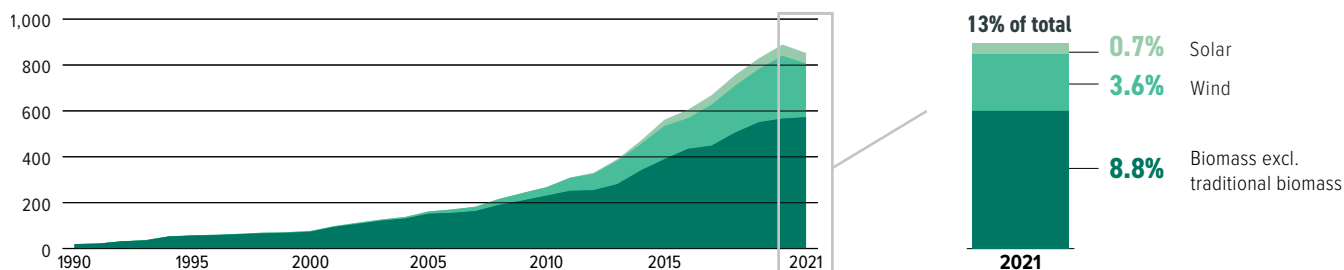


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating and cooking, but also for transport fuels. Fossil fuels (oil, coal, and gas) make up 76% of the UK energy mix, which is lower than the G20 average. Total energy supply was flat from 1990–2005 and has since declined. There have been particularly strong reductions in coal demand, due to the near-complete phase-out of coal in the power sector. Gas demand has increased 40% over 1990–2021. Renewable energy has grown twelve-fold over the period but still represents a limited proportion of total supply.

Enerdata, 2022

Solar, wind, geothermal and biomass development

As a share of total primary energy supply (TPES) (PJ)

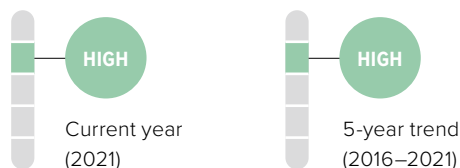


Solar, wind, geothermal and biomass, excluding traditional biomass, account for 13% of the UK's energy supply – the G20 average is 7.5%. The share of renewables in total energy supply has increased by around 60% in the last 5 years in the UK (2016–2021), up from 8.1% in 2016. Bioenergy makes up the largest share. Biomass is predominantly used for electricity production.

Enerdata, 2022

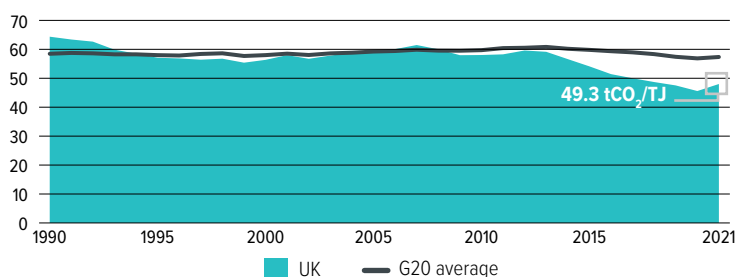
Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.

Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

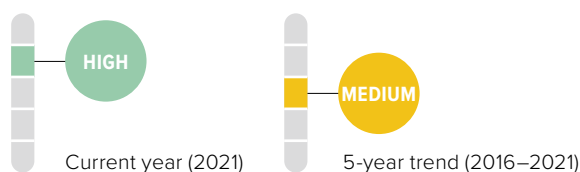


Carbon intensity of the energy sector

Tonnes of CO₂ per unit of TPES (tCO₂/TJ)



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Carbon intensity is a measure of how much CO₂ is emitted per unit of energy supply. The UK's current carbon intensity is 14% below the G20 average. Carbon intensity fell only gradually over 1990–2010, before accelerating as renewables replaced coal in the power sector. Carbon intensity rebounded in 2021 to 4% above 2020 values. This must be reversed, and cuts to carbon intensity accelerated if the UK is to align itself with 1.5°C.

Enerdata, 2022

Energy supply per capita

TPES per capita (GJ/capita) in 2021



The level of energy supply per capita is closely related to economic development, climatic conditions and the price of energy. In 2021, energy supply per capita in the UK was 96.8 GJ, close to the G20 average. It decreased significantly — by 17.8 % between 2016 and 2021 — in contrast to the increasing G20 average of 1.6% over the same period.

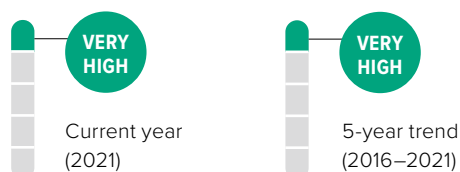
Enerdata, 2022; World Bank, 2022

Energy intensity of the economy

(TJ/million US\$2015 GDP) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of decarbonisation, efficiency achievements, climatic conditions or geography. The UK's energy intensity is lower than the G20 average and has been decreasing at a higher speed, falling 15.1% between 2016–2021. In comparison, the energy intensity of the G20 fell 6.3% over the same period.

Enerdata, 2022; World Bank, 2021

POWER SECTOR

Emissions from energy used to make electricity and heat



Worldwide, coal use for power generation needs to peak by 2020, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal reduced to zero.

Climate Action Tracker, 2020; Rogelj et al., 2018



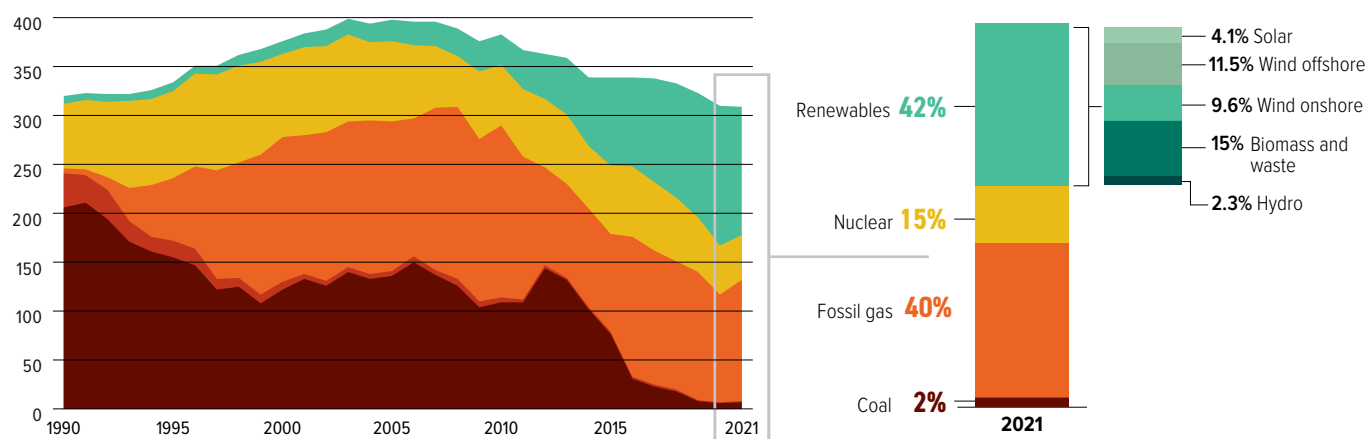
The UK produced 2% of its electricity from coal in 2021. The UK is committed to phasing out coal in electricity generation by 2024, but still **generates a considerable share of its electricity from fossil gas power plants – over 40%**. In 2021, there was 14 GW of gas-fired capacity in the pipeline for development.

Power generation's share of energy-related CO₂ emissions in 2021:

15%

Electricity generation mix

Gross power generation (TWh)

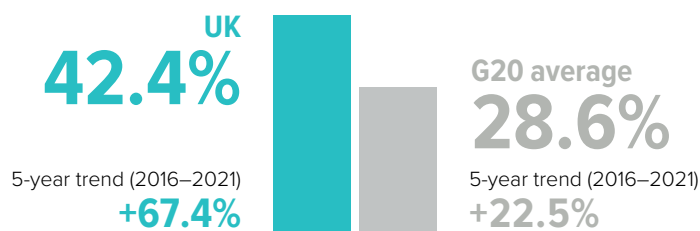


The UK generated 43% of its electricity from fossil fuels in 2021, mainly from fossil gas, but with minimal amounts of coal (2.3%) and oil (0.39%). The share of renewable energy in the UK's power sector has been increasing rapidly, providing around 42% in 2021, up from 13% a decade ago. Wind and solar alone produced 25% of all electricity generated. Renewables have displaced coal from the power sector.

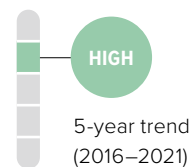
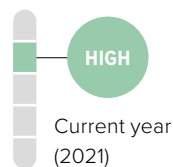
Enerdata, 2022

Share of renewables in power generation

(incl. large hydro) in 2021



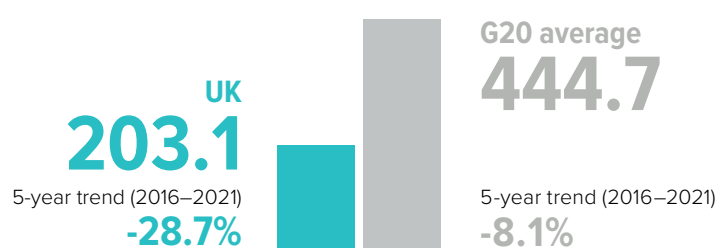
Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



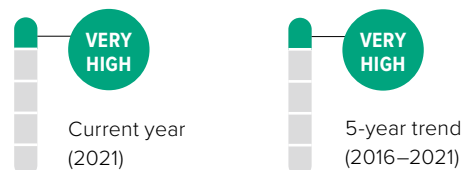
Enerdata, 2022

Emissions intensity of the power sector

(gCO₂/kWh) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



For each kilowatt hour of electricity, 203g of CO₂ are emitted in the UK – under half the G20 average. Emissions intensity fell 29% over 2016–2021, as renewables displaced coal-fired generation. Further progress will require reductions in gas-fired power, which gained urgency after the Russian invasion of Ukraine's drove up energy prices.

Enerdata, 2022

POLICY ASSESSMENT

Renewable energy in the power sector



The UK continues to lead the G20 in power sector decarbonisation. It has committed to 100% clean electricity by 2035, and renewables deployment is accelerating. There is a target of 50GW offshore wind by 2030, and solar capacity is projected to grow five-fold by 2035. The latest Contracts for Difference auction secured 11 GW of renewables, including 7 GW of offshore wind at a record low strike price of GBP 37/MWh. These auctions will now be held annually rather than biennially, which will accelerate deployment, but the role of fossil gas in electricity generation needs to decrease substantially.

UK Government, 2021d, 2022b, 2022c

Coal phase-out in the power sector

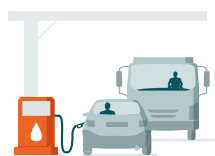


In 2021, the UK government confirmed it will bring forward the date of its planned coal phase-out from 2025 to 2024. Ending coal generation by the end of 2024 will mean the UK will have gone from generating a third of its electricity from coal to none in the space of just 10 years. The UK also partnered with Canada to launch the Powering Past Coal Alliance (PPCA), which is working to advance coal phase-outs around the world.

PPCA, 2017; UK Government, 2021b

TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Emissions from transport remained fairly flat from 1990 to 2019, but fell 19% in 2020 due to COVID-19 lockdowns, before rebounding 10% in 2021. Transport by road still dominates passenger and freight movement, and the sector is primarily fuelled by oil use. Electric vehicles (including plug-in hybrids) represented 19% of car sales in 2021, and this share is increasing rapidly and is currently above the sales volumes expected in the Government's own roadmap to net zero emissions.

Transport's share of energy-related CO₂ emissions in 2021: **32.4%** Direct **0.2%** Indirect

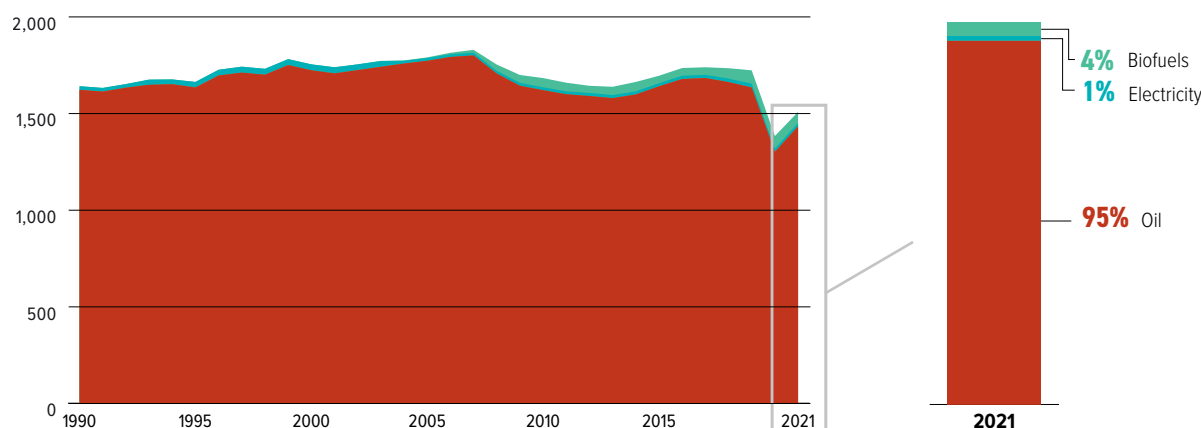


The share of low-carbon fuels in the transport fuel mix must **increase** to between 40% and 60% by 2040 and 70% to 95% by 2050.

Climate Action Tracker, 2020; Rogelj et al., 2018

Transport energy mix

Final energy consumption by source (PJ/year)



Electricity and biofuels make up only 5% of the energy mix in transport.

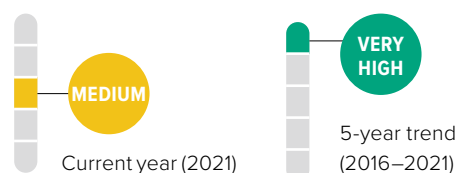
Enerdata, 2022

Transport emissions per capita

(excl. aviation) (tCO₂/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

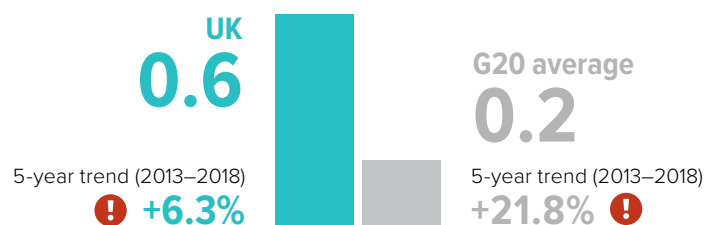


Per capita emissions in 2021 and the 5-year trend have been impacted by COVID-19 pandemic response measures and resulting economic slowdowns. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2022, please see the Highlights Report at www.climate-transparency.org

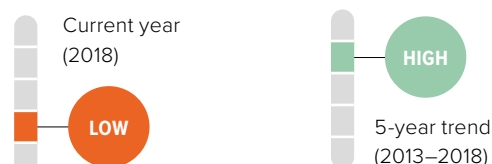
Enerdata, 2022; World Bank, 2022

Aviation emissions per capita⁶

(tCO₂/capita) in 2018

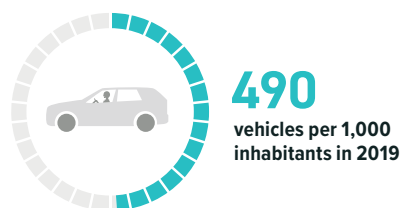


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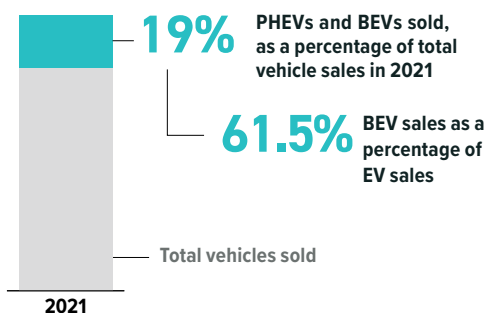
Enerdata, 2022; IEA, 2021a; World Bank, 2022

Motorisation rate



Enerdata, 2022

Market share of electric vehicles in new car sales (%)

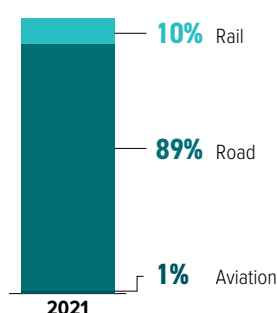


Battery-Electric Vehicles (BEVs) have greater emissions mitigation potential when they are powered by electricity produced by renewables because they have no internal combustion engine (ICE), whereas plug-in hybrids (PHEVs) still produce emissions when using the ICE.

IEA, 2022

Modal split passenger transport

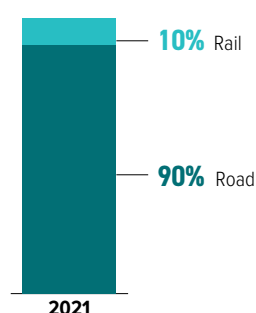
(% of passenger-km): road, rail and air



Enerdata, 2022

Modal split freight transport

(% of tonne-km): road, rail



Due to data availability, only road and rail transport are included in the freight transport category. Other freight modes, e.g. waterways, are excluded due to lack of data for all countries.

Enerdata, 2022

POLICY ASSESSMENT

Phase out fossil fuel cars



The UK will ban the sale of new petrol and diesel cars and vans by 2030. Only hybrids with 'significant zero emissions capacity' will be sold post-2030, with all hybrid sales banned by 2035. This policy is supported by a zero emissions vehicle (ZEV) mandate, which will set legally binding targets for sales of ZEVs from 2024. The UK has also set out a strategy to achieve 300,000 public charging points by 2030. However, accompanying policies to reduce emissions from fossil-fuelled vehicles are too weak and need strengthening.

CCC, 2022; UK Government, 2021a, 2021e

Phase out fossil fuel heavy-duty vehicles



The UK has committed to ending the sale of small (below 26 tonnes) heavy goods vehicles (HGVs) by 2035, and large HGVs (above 26 tonnes) by 2040. The Government has already allocated GBP 19m to support small-scale trials of different zero-carbon HGV options and announced an additional GBP 200m to support a 3-year comparative programme. The Department for Transport is also consulting on a faster phase-out of petrol/diesel buses in the period of 2025–2032, motivated in part by the strong air quality benefits of electrifying buses.

CCC, 2022; Department for Transport, 2022; UK Government, 2021d, 2022a

Modal shift in (ground) transport



The UK has committed GBP 3bn to a national bus strategy, which aims to make buses faster and more reliable, and GBP 2bn to supporting active travel. At the same time, there are a range of key weaknesses in the Government's current approach. First, there is no strategy to limit aviation growth, despite clear recommendations from the CCC. There is also a large budget for road building, which needs to be reassessed in light of projected passenger demand on the road to net zero.

CCC, 2020b; Green Alliance, 2021; UK Government, 2021a, 2022d

BUILDINGS SECTOR

Emissions from energy used to build, heat and cool buildings



Direct and indirect emissions from the buildings sector in the UK account for 27.7% and 9.1% of total energy-related CO₂ emissions, respectively. Per capita emissions from the buildings sector are 1.2 times the G20 average. The UK's policies are not sufficient for a 1.5°C pathway.

Buildings sector's share of energy-related CO₂ emissions in 2021:

27.7% Direct **9.1%** Indirect

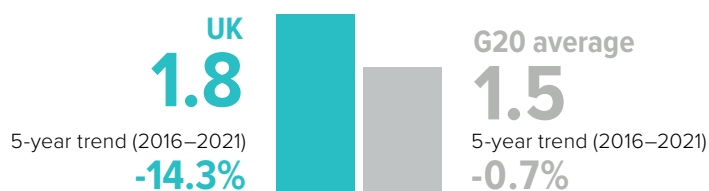


By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95–100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

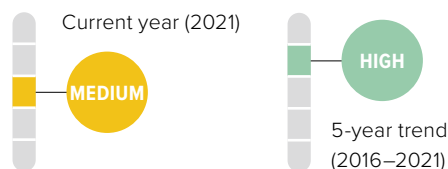
Climate Action Tracker, 2020; Rogelj et al, 2018

Buildings sector emissions per capita

incl. indirect emissions (tCO₂/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Buildings emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (from grid-electricity for air conditioning, appliances, etc.). Buildings-related emissions per capita were approximately 1.2 times the G20 average in 2021, likely because, despite having lower energy intensity than the G20 average (at 0.4GJ/m² for residential buildings, compared to the G20's 0.49GJ/m²), the UK's buildings sector is dominated by gas, which provides around 75% of the heating and hot water demand. The UK has decreased per capita emissions from buildings by 14.3% between 2016–2021, a substantially more pronounced decline than the 0.7% G20 average decrease over that period.

Enerdata, 2022; World Bank, 2022

POLICY ASSESSMENT

Near zero energy new buildings



The Future Homes Standard requires that, from 2024, new homes must include high levels of fabric efficiency and zero-carbon heating systems, such as heat pumps or district heating. Houses will have emissions 75–80% lower than homes built under current standards (including indirect emissions). An interim reduction target of 31% has been set for 2021–2024. However, there is no commitment to reach ultra-high efficiency standards, and the interim standard still allows houses to be built with gas boilers. It may, therefore, fail to accelerate construction of zero carbon buildings pre-2024.

CCC, 2021, 2022; UK Government, 2021g, 2021c

Renovation of existing buildings



The Government aims for all homes in England and Wales to reach an Energy Performance Certificate (EPC) rating of "C" by 2035, where practical, cost-effective and affordable; up from only 30% of homes with a C rating in 2019. But policy details are lacking. There is no funding for renovation in owner-occupied homes, and no regulations to drive improvements. The Energy Security Strategy failed to address this issue, despite energy efficiency being a key solution to current high energy bills. There are greater policy frameworks to drive renovation in social housing, with GBP 8.2bn committed out to 2026.


CCC, 2021; UK Government, 2021c

INDUSTRY SECTOR

Emissions from energy use in industry



Direct and indirect emissions from industry in the UK make up 16.3% and 4.4% of energy-related CO₂ emissions, respectively. The UK's emissions intensity of the industry sector is well below the G20 average and has seen a more rapid decrease between 2013–2018.



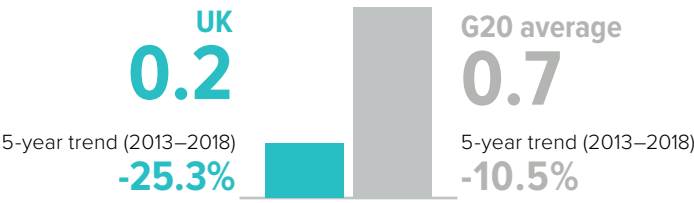
Industrial emissions need to be reduced by 65–90% from 2010 levels by 2050.

Rogelj et al., 2018



Industry emissions intensity⁷

(kgCO₂e/USD2015 GVA) in 2018



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

VERY HIGH

Current year (2018)

VERY HIGH

5-year trend (2013–2018)

Enerdata, 2021; World Bank, 2022

Carbon intensity of steel production⁸

(kgCO₂/tonne product) in 2019



Steel production and steelmaking are significant GHG emissions sources, and challenging to decarbonise.

Enerdata, 2022; World Steel Association, 2021

POLICY ASSESSMENT

Energy efficiency



The UK's industrial decarbonisation strategy aims to cut emissions by at least two-thirds in 2035 (below 2019), and by at least 90% in 2050. In addition, the Net Zero Strategy projects that resource and energy efficiency will save 11 MtCO₂e in 2035, representing 27% of total abatement, which is more than from CCS, hydrogen or electrification. Policies to support energy efficiency include the Industrial Energy Transformation Fund (IETF) and the Climate Change Agreements; other supportive measures include business models for hydrogen and CCS deployment. More action is needed to drive industrial resource efficiency, in both the production and consumption of goods. Key to improving this is expanding the scope of current extended producer responsibility (EPR) schemes and improving data transparency on the production and use of industrial products. More also needs to be done to expand electrification in industry and incentivise improvements in resource efficiency.

CCC, 2022; UK Government, 2021d

LAND USE SECTOR

Emissions from land use change and forestry



To stay within the 1.5°C limit, the UK needs to make the land use and forestry sector a net sink of emissions. In the UK, this will require restoring dried and degraded peatlands, halting further degradation, converting cropland into wetlands, and creating new forests.

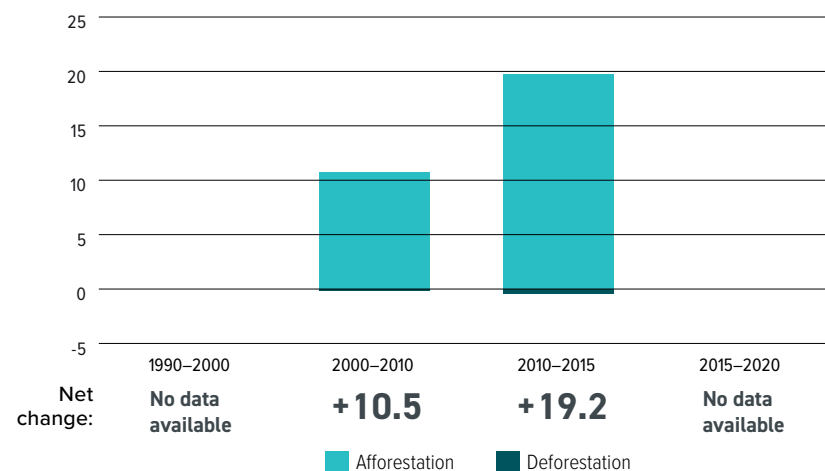


Global deforestation needs to be halted and changed to net CO₂ removals by around 2030.

Rogelj et al., 2018

Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year



Between 2015–2020, the UK added 19.2 kha of forest area per year. Around 80% of this afforestation was in Scotland.

Global Forest Assessment, 2020

POLICY ASSESSMENT

Target for net zero deforestation



The UK has historically deforested its landscape, leaving only 13% of the land forested. The UK aims to plant 30 kha of trees per year by 2024, in line with the CCC's recommendations. This rate needs to rise to 50 kha/y between 2035 and 2050. The Government has committed over GBP 500m via the Nature for Climate Fund to drive afforestation out to 2025 and is considering developing carbon markets to drive private investment in afforestation.

CCC, 2020a, 2020b; UK Government, 2021f

AGRICULTURE SECTOR

Emissions from agriculture



The UK's agricultural emissions are primarily from the digestive processes and manure of livestock (mainly cattle). A 1.5°C compatible pathway requires behavioural and dietary shifts and new low-carbon farming practices.

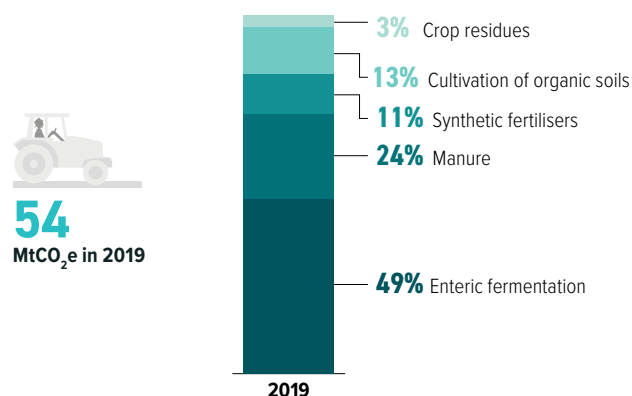


Methane emissions need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Rogelj et al., 2018

Emissions from agriculture

excluding energy emissions, in 2019



In the UK, the largest sources of GHG emissions in the agriculture sector are enteric fermentation from cows and sheep (49%), and from manure (24%). Manure can release CH₄ and N₂O directly, as well as indirectly producing N₂O by the leaching of nitrogen from applied manure. Adapting animal diets; improving manure handling and storage; implementing more efficient use of synthetic fertilisers; making dietary changes as well as reductions in food waste could help reduce emissions from this sector.

FAO, 2022

MITIGATION: TARGETS AND AMBITION



The science from the IPCC on the risks of exceeding 1.5°C warming is clear. The UN science body has projected that to keep the 1.5°C goal alive, the world needs to roughly halve emissions by 2030.

However, despite the Glasgow Climate Pact (1/CMA.3) agreement to “revisit and strengthen” 2030 targets this year, progress on more ambitious targets has stalled. Without far more ambitious government action, the world is heading to a warming of **2.4°C with the current 2030 targets** and even higher warming of **2.7°C with current policies**.

Climate Action Tracker, 2021a, 2022c; IPCC, 2022; UNFCCC, 2021

AMBITION: 2030 TARGETS

Nationally Determined Contribution: Mitigation

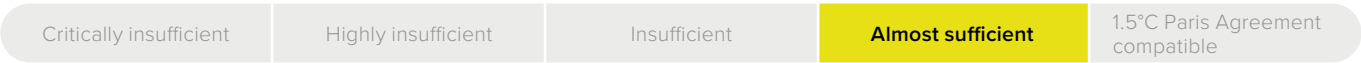
TARGETS

At least a 68% reduction below 1990 levels by 2030 (incl. LULUCF emissions)

ACTIONS

Not mentioned

Climate Action Tracker (CAT) evaluation of targets and actions



The CAT evaluates and rates several elements of climate action: policies and actions, targets, and a country’s contribution to climate finance (where relevant) and combines these into an overall rating.

The CAT rates the UK’s overall contribution to climate change mitigation as “almost sufficient”. This reflects the fact that some elements of the UK’s climate policies and commitments are not yet consistent with the Paris Agreement’s 1.5°C temperature limit but could be with moderate improvements.

The UK’s 2030 emissions target is one of the few domestic targets which is aligned with 1.5°C when compared to global least-cost modelled domestic pathways. When considering an equitable allocation of emissions reductions across countries, the UK’s targets are far below what would represent a fair contribution. There is also a significant gap between the UK’s targets and its policy. Less than 40% of the required emissions reductions are covered by policies that use proven delivery mechanisms and have sufficient funding to support them. Significant delivery risks, therefore, remain in many areas. Finally, the UK’s provision of climate finance is “highly insufficient” when compared to the UK’s obligations and capacity to provide such finance.

This CAT analysis was updated in September 2022.

For the full assessment of the country’s targets and actions, and the explication of the methodology, see www.climateactiontracker.org

Climate Action Tracker, 2022a

AMBITION: LONG-TERM STRATEGIES

The Paris Agreement invites countries to communicate mid-century, long-term, and low-GHG emissions development strategies. Long-term strategies are an essential component of the transition toward net zero emissions and climate-resilient economies.

Status	The UK has submitted the Net Zero Strategy to the UNFCCC as its long-term strategy. This was submitted in 2021.
Net zero target	Net zero by 2050
Interim steps	Yes: at least -68% by 2030 and 78% by 2035 from 1990 levels, in line with the Sixth Carbon Budget.
Sectoral targets	Yes

FINANCE

Paris Agreement: Make finance flows consistent with a pathway towards low-GHG emissions and climate-resilient development.



Fossil fuel subsidies peaked in 2013 but, after a sharp decline, have fluctuated little between 2016 and 2020. **The UK Emissions Trading Scheme raised approximately USD 8.5bn in its first year of operation (2021).**



Investment in green energy and infrastructure needs to outweigh fossil fuel investments by 2025.

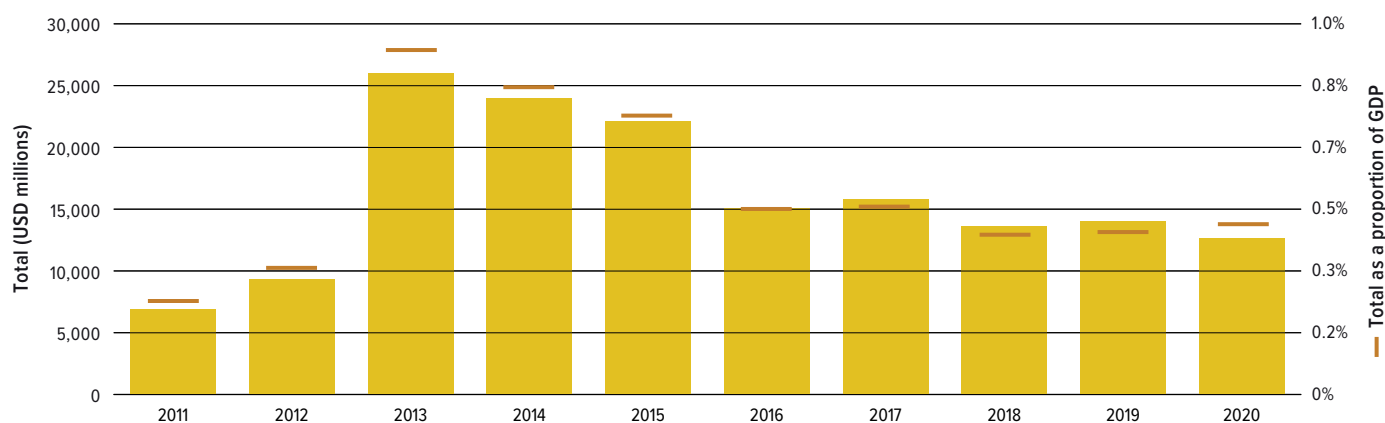
Rogelj et al., 2018

FISCAL POLICY LEVERS

Fiscal policy levers raise public revenues and direct public resources. Critically, they can shift investment decisions and consumer behaviour towards low-carbon, climate-resilient activities by reflecting externalities in the price.

Fossil fuel subsidies relative to national budgets

(USD millions)



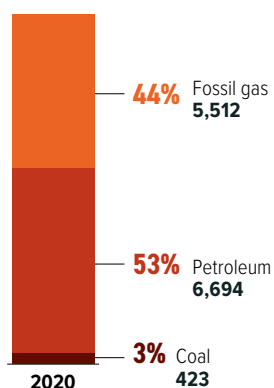
OECD-IEA Fossil Fuel Support Database, 2022

Fossil fuel subsidies by fuel type

(USD millions) in 2020



12,629
USD millions



Fossil fuel subsidies in the UK have declined since 2013 to reach USD 12.63bn in 2020. Roughly three-quarters were directed at consumption, rather than production. Petroleum received 53% and fossil gas 44%, with USD 422m (3%) going to coal.

A reduced tax rate for domestic fuel and power accounts for some 34% of the subsidies. This fluctuates according to energy prices, and it is likely that subsidies will have increased in light of the current energy crisis. The UK government has already implemented new consumer subsidies to deal with rising energy prices, granting GBP 400 to all households.

BEIS, 2022; Energy Policy Tracker, 2022; OECD-IEA Fossil Fuel Support Database, 2022

Carbon pricing and revenue

In 2013, the UK introduced a national carbon tax (Carbon Price Floor) that generated USD 968m in 2021; the scheme covers 21% of the country's emissions through the power sector, priced at USD 24/tCO₂e. Following Brexit, from 1 January 2021, a UK Emissions Trading Scheme (UK ETS) replaced the UK's participation in the EU ETS. The new domestic carbon market largely mirrors the EU ETS, covering 28% of country's emissions through the power, industry and domestic aviation sectors. The average price of allowances auction settled at USD 79/tCO₂ and the mechanism raised nearly USD 8.5bn in 2021.

I4CE, 2022; Energy Policy Tracker, 2021

FINANCIAL POLICY AND REGULATION

Through policy and regulation, governments can overcome challenges to mobilising green finance, including real and perceived risks, insufficient returns on investment, capacity and information gaps.

The UK has taken significant steps to green its financial system. The second round of a Bank of England (BoE) climate change stress test to explore the exposure of the financial system to physical and transition risks is due at the end of 2022, while the Prudential Regulation Authority will begin to actively supervise its expectations for managing climate change related risks. These include the integration of risks into governance frameworks, conducting scenario analyses and – from April 2022 – enforcing the disclosure of climate risks along the guidelines set by the Task Force on Climate-Related Financial Disclosures (TCFD), established in 2015 by the Financial

Stability Board. This applies to 1,300 organisations with more than 500 employees each, and all firms will be required to do so by 2025. There are proposals to extend the disclosure requirements to International Sustainability Standards Board recommendations when they are published later this year.

A sustainable finance taxonomy is being developed by the Green Technical Advisory Group to the UK government. The Task Force on Nature-Related Financial Disclosures, which plans to issue a framework for disclosing nature-based risks in 2023.

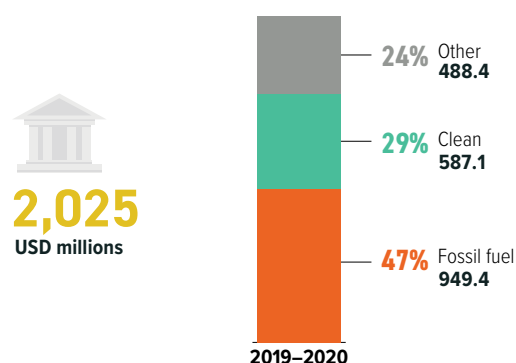
Alekseyev et al., 2022; Bank of England, 2021; BEIS, 2021; HM Treasury, 2021; Task Force on Nature-Related Financial Disclosures (TNFD), 2022

PUBLIC FINANCE

Governments steer investments through their public finance institutions, including via development banks both at home and overseas, and green investment banks. Developed G20 Members also have an obligation to provide finance to developing countries, and public sources are a key aspect of these obligations under the UNFCCC.

Public finance for energy

USD millions (2019–2020 average)



Between 2019–2020 the UK provided an average of USD 2bn/year in public finance to energy projects. Around 47% went to fossil fuels, of which 92% was for fossil gas and 5% for coal. The single largest amount of financing, of USD 780m, was a guarantee for the development of a LNG plant in Mozambique in 2020, which was accompanied by a further loan of USD 330m. Other significant investments include the expansion of the Sitra oil refinery in Bahrain, for USD 400m in 2019, and offshore wind farms in Taiwan for a combined total of USD 800m in 2019. The UK also gave USD 56m to a Russian mining company specialising in coal in 2019, but UK Export Finance provided only cursory information.

At COP26 in Glasgow, the UK pledged to end direct international public finance to fossil fuels by the end of 2022 and reaffirmed its pledge as part of a G7 commitment in May 2022.

Oil Change International, 2022

Provision of international public support

USD millions, annual average 2017 and 2018

Bilateral, regional and other channels:	Multilateral climate finance contributions:	Core/general contributions:
Annual average contribution	Annual average contribution	Annual average contribution
1,115.62	244.22	2,731.15

Annex II countries to the UNFCCC, including the UK, are obligated to provide climate finance and have committed to collectively mobilise USD 100bn a year to 2025, when this goal will be renewed, even though the target has never been met.

The UK ranks sixth for its bilateral climate finance commitments and for its commitments to multilateral climate funds, in absolute terms. The 2017–2019 period saw a levelling off of bilateral spending and a halving in flows through multilateral climate funds (with core general contributions increasing).

Fair share of the USD 100bn climate finance goal:

This fair share analysis allocates responsibility for the provision of climate finance to each Annex II country based on their gross national income (GNI), cumulative territorial CO₂ emissions since 1990, and population size. It uses the UNFCCC Biennial Report data for 2017–2018 and climate-related finance data provided by the OECD Development Assistance Committee for 2019 and 2020.

The UK does not pay its fair share of the USD 100bn climate finance goal, contributing about half of what it should have in 2017–2018, 2019 and 2020. However, all its climate finance contributions are in the form of grants, implying no further indebtedness from recipient countries. Furthermore, its contributions are balanced between mitigation and adaptation objectives.

Climate finance provided (USD billion) by UK and its fair share of the USD 100bn goal:

2.81	2017–2018 average	>	48%	Progress towards fair share
2.90	in 2019	>	50%	Progress towards fair share
3.20	in 2020	>	55%	Progress towards fair share

However, despite aid cuts reducing the UK’s aid to 0.5% of GNI in 2021, the UK has ring-fenced climate-related spending. The UK doubled its initial contribution to the Green Climate Fund during its replenishment, amounting to USD 1.9bn, and doubled its climate finance commitment in the 2021–2026 period to GBP 11.6bn at COP26, an amount still way below the country’s fair share of the USD 100bn climate finance goal.

Colenbrander et al., 2022; COP26 Presidency, 2021

Note: Data on the ‘provision of international public support’ corresponds to 2017–2018 as per the UNFCCC Fourth Biennial Report (BR). Parties are to submit data by December 2022 for subsequent years in the Fifth BR.

Endnotes

For more detail about sources and methodologies, please download the CTR Technical Note at: www.climate-transparency.org/g20-climate-performance/g20report2022

Where referenced, “Enerdata, 2022” refers to data provided in July 2022 and, due to rounding, graphs may sum to slightly above or below 100%.

- 1 The ‘1.5°C compatible pathway’ is derived from global cost-effective pathways assessed by the IPCC’s SR15, selected based on sustainability criteria, and defined by the 5th–50th percentiles of the distributions of such pathways achieving the long-term temperature goal of the Paris Agreement. Negative emissions from the land sector and novel negative emissions technologies are not included in the assessed models, which consider one primary negative emission technology (BECCS). In addition to domestic 1.5°C compatible emissions pathways, the ‘fair share’ emissions reduction range would almost always require a developed country to provide enough support through climate finance, or other means of implementation, to bring the total emissions reduction contribution of that country down to the required ‘fair share’ level.

2 ‘Land use’ emissions is used here to refer to land use, land use change and forestry (LULUCF). The Climate Action Tracker (CAT) derives historical LULUCF emissions from the UNFCCC Common Reporting Format (CRF) data tables, converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from LULUCF, which under the IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).
- 3 The Decarbonisation Ratings assess the current year and average of the most recent 5 years (where available) to take account of the different starting points of different G20 Members.

4 The selection of policies rated and the assessment of 1.5°C compatibility are primarily informed by the Paris Agreement and the IPCC’s 2018 SR15. The Policy Assessment Criteria table below (on page 19) displays the criteria used to assess a country’s policy performance.

5 In order to maintain comparability across all countries, this report harmonises all data with PRIMAP 2021 dataset to 2018. However, note that CRF data is available for countries which have recently updated GHG inventories.

6 This indicator adds up emissions from domestic aviation and international aviation bunkers in the respective country. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.

7 This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.

8 This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

Policy Assessment Criteria

	LOW	MEDIUM	HIGH	FRONTRUNNER
Renewable energy in power sector	No policies to increase the share of renewables	Some policies	Policies and longer-term strategy/ target to significantly increase the share of renewables	Short-term policies + long-term strategy for 100% renewables in the power sector by 2050 in place
Coal phase-out in power sector	No targets and policies in place for reducing coal	Some policies	Policies + coal phase-out decided	Policies + coal phase-out date before 2030 (OECD and EU28) or 2040 (rest of the world)
Phase out fossil fuel cars	No policies for reducing emissions from light-duty vehicles	Some policies (e.g. energy/emissions performance standards or bonus/ malus support)	Policies + national target to phase out fossil fuel light-duty vehicles	Policies + ban on new fossil fuel-based light-duty vehicles by 2035 worldwide
Phase out fossil fuel heavy-duty vehicles	No policies	Some policies (e.g. energy/emissions performance standards or support)	Policies + strategy to reduce absolute emissions from freight transport	Policies + innovation + strategy to phase out emissions from freight transport by 2050
Modal shift in (ground) transport	No policies	Some policies (e.g. support programmes to shift to rail or non-motorised transport)	Policies + longer-term strategy	Policies + longer-term strategy consistent with 1.5°C pathway
Near zero energy new buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + national strategy for near zero energy new buildings	Policies + national strategy for all new buildings to be near zero energy by 2020 (OECD countries) or 2025 (non-OECD countries)
Energy efficiency in industry	No policies	Mandatory energy efficiency policies cover more than 26–50% of industrial energy use	Mandatory energy efficiency policies cover 51–100% of industrial energy use	Policies + strategy to reduce industrial emissions by 75–90% from 2010 levels by 2050
Retrofitting existing buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + retrofitting strategy	Policies + strategy to achieve deep renovation rates of 5% annually (OECD) or 3% (non-OECD) by 2020
Net zero deforestation	No policies or incentives to reduce deforestation in place	Some policies (e.g. incentives to reduce deforestation or support schemes for afforestation/ reforestation in place)	Policies + national target for reaching net zero deforestation	Policies + national target for reaching zero deforestation by 2020s or for increasing forest coverage

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